

Anaesthesia Management of Patient at 16 weeks Pregnancy with Primary Malignant bone Tumour Underwent Hemipelvectomy surgery



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ABSTRACT

Chondrosarcoma is a type of sarcoma that affects the bones and joints. It is a rare cancer that accounts for about 20% of bone tumours and is diagnosed in approximately 600 patients each year in the United States. Chondrosarcoma typically affects adults between the age of 20 and 60 years old. The disease usually starts in the bones of the arms, legs or pelvis, but it can be found in any part of the body that contains cartilage. Sometimes chondrosarcoma grows on an otherwise healthy bone or it grows on a benign bone tumour (an enchondroma or osteochondroma). Non-obstetric surgery during pregnancy is not uncommon and can have excellent outcomes with the proper planning. Between 0.75% and 2% of pregnant women require non-obstetric surgery. Surgery can be required during any stage of pregnancy depending on the urgency of the indication. When caring for pregnant women undergoing non-obstetric surgery, safe anaesthesia must be provided for both the mother and the child. A thorough understanding of the physiological and pharmacological adaptations to pregnancy is

required to ensure maternal safety. Fetal safety requires avoidance of potentially dangerous drugs at critical times during fetal development, assurance of continuation of adequate uteroplacental perfusion, and avoidance and/or treatment of preterm labour and delivery. Pregnant patients beyond 18–20 weeks of gestation should be positioned with a 15° left lateral tilt, to reduce aortocaval compression and supine hypotension syndrome. Regional anaesthesia with combined spinal-epidural is an option for this case. Regional anaesthesia does reduce the exposure of the foetus to potential teratogens, avoids the potential risk of failed intubation and aspiration, and provides excellent postoperative analgesia. The major concern with neuraxial anaesthesia is maternal hypotension, which may reduce placental perfusion. During anaesthesia and surgery, foetal well-being is best ensured by careful maintenance of stable maternal haemodynamic parameters and oxygenation. Close monitoring of foetal responses for signs of distress is strongly advocated.

Keyword: Chondrosarcoma, Maternal safety, Fetal safety, Neuraxial anaesthesia, High risk pregnancy

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INTRODUCTION

Chondrosarcoma is a malignant tumour of chondrocytes, the cells that produce cartilage. Chondrocytes are present in all the bones of the skeleton so a chondrosarcoma can arise in any bone but it is most commonly found in the femur (thigh bone), humerus (upper arm bone), tibia (larger bone in the lower leg), the pelvis, and the ribs.

It is the second most common primary malignant solid tumour of bone and accounts for approximately 25% of all bone sarcomas. It is largely considered to be resistant to conventional chemotherapy and radiotherapy. As such, surgical resection has been the cornerstone of treatment for over 50 years. There is no known cause of a chondrosarcoma. A chondrosarcoma is first suspected when an x-ray is taken and it shows a suspicious lesion in the area of the patient's complaint. Depending

on the aggressiveness (or grade), chondrosarcomas produce different patterns of bony destruction on the image.

In this case report, patients with primary malignant bone tumour and 16 weeks of pregnancy, which if the tumour is not removed, will grow more invasive and inhibit the foetal growth in the womb. Therefore, this surgery is considered as an elective surgery but should be done immediately before the tumour affects foetal growth.

The knowledge and ability of an anaesthesiologist in dealing with patients with this disorder will play a very important role in the success of the surgery. Understanding the possible complications, long-term outcomes and residual symptoms following surgery will determine the prognosis of the patient.

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CASE REPORT

A 22 years old female that was 16 weeks of pregnant with a right hip primary malignant bone tumour presented with chief complaints of a lump on the upper right thigh that had arose approximately 1 year previously. The lump was felt small at first and has become larger. The patient feels moderate pain in the lump, the lump is felt to wedge while walking or resting on the right foot, and the pain is felt less during rest or sitting. From the patient's physical examination, the respiration rate was 14 times per minute, without rhonchi or wheezing, with peripheral oxygen saturation of 99% in room air. Blood pressure was 125/85 mmHg and heart rate was 92 beats per minute. From Pelvic MRI obtained a destruction of the superior and right inferior pubic pars with a bulging soft tissue mass around 11.9×6.7 cm, and the mass pushes the anterior wall of the pelvis, the posterior wall of the urine bladder, the uterus, and the right inguinal. The patient also had a pelvic biopsy with the results of malignant chondroid matrix producing tumour suspect high-grade chondrosarcoma. The patient underwent a hemipelvectomy surgery under regional anaesthesia with a combined spinal epidural technique.

The patient arrived at the operating room, and monitor installation was done, with pulse rate at 82-87 times per minute and SaO₂ 99% with O₂ nasal cannula 2 L/min. The blood pressure measurement was found to be 125/76 mmHg. The patient was given premedication with dexamethasone 10 mg, diphenhydramine 10 mg, and midazolam 1 mg.

The patient was placed in the left lateral position and disinfected with alcohol and betadine. The epidural catheter was inserted at L 3-4 with a Tuohy 17G needle. A loss of resistance was obtained at 5 cm therefore the catheter was inserted with a depth of 5 cm in epidural space. The length of the catheter in the epidural space was 10 cm. Aspiration was obtained with vacuum air in the epidural catheter at which point the pulse was 85 times per minute. A test dose began with lidocaine (1.5%) and epinephrine (1:200,000) made up to a volume of 3 mL, The patients pulse was measured at 83-84 times per minute. At this point, epidural catheter fixation was performed followed by spinal anaesthesia on L4-5 with a 27G spinal needle with a bupivacaine heavy dose of 0.5% (15 mg). The patient was then re-positioned supine. After 5 minutes, the blood pressure was re-evaluated at 115/75 mmHg and the pulse was 82 times per minute. To prevent hypothermia, the patient was given warm IV fluid and the upper body was covered with a blanket.

At 3 hours after the surgery began, an epidural analgesia was administered with bupivacaine plain 0.25% in 10 mL and was intermittently administered

every 2 hours. During the operation, the patient was sedated with propofol with target controlled infusions of 50 mcg/kg body weight/minute. Blood pressure fluctuations were measured at approximately 85-125 / 62-73 mmHg, pulse fluctuations ranged from 85 to 120 times per minute. Approximately 30 minutes before the surgery was done, the patient was given an epidural analgesia dose with bupivacaine 0.1%, and morphine 1.5 mg in 10 mL of volume. Upon re-evaluation at the end of the operation, the patient had a blood pressure of 115/70 mmHg, and the heart rate was 90 times per minute. The operation was completed in 12 hours and 5 minutes with a bleeding estimation of 900 mL. Then after the surgery, the patient was transferred to the intensive care unit for further treatment.

DISCUSSION

Chondrosarcoma is a primary malignant bone tumour with cartilaginous differentiation. The only available treatment is oncologic surgical resection since the usual adjuvant treatments are ineffective. Surgery during pregnancy is complicated by the need to balance the requirements of two patients. Under usual circumstances, surgery is only conducted during pregnancy when it is absolutely necessary for the well-being of the mother, foetus, or both. Even so, the outcome is generally favourable for both the mother and the foetus.

Haemodynamic changes during pregnancy include a 40–50% increase in blood volume and cardiac output and a 20% reduction in haematocrit due to dilution. Physiological anaemia begins during the first trimester of pregnancy and is most extreme in the mid-second trimester after which it is mitigated to some extent by enhanced red blood cell production if iron stores are adequate. Aortocaval compression is of concern to the anaesthesiologist during and after the second trimester. Particularly, in the presence of neuraxial anaesthesia, the supine position can predispose the mother to hypotension, especially after the 20th week of gestation. In addition, the growing uterus can lead to reduced venous return from the lower extremities predisposing to pedal oedema and increasing the already elevated risk for deep vein thrombosis. These considerations underscore the need for left uterine displacement in later pregnancy during surgery and anaesthesia.

All general anaesthetic drugs cross the placenta and there is no optimal general anaesthetic technique. There is weak evidence that nitrous oxide should be avoided in early pregnancy due to a potential association with pregnancy loss with high exposure. There is evidence in animal models that many

general anaesthetic techniques cause inappropriate neuronal apoptosis and behavioural deficits in later life. It is not known whether these considerations affect the human foetus but studies are underway. Given the general considerations of avoiding foetal exposure to unnecessary medication and potential protection of the maternal airway, regional anaesthesia is usually preferred in pregnancy when it is practical for the medical and surgical condition. When surgery is indicated during pregnancy, maintenance of maternal oxygenation, perfusion and homeostasis with the least extensive anaesthetic that is practical will assure the best outcome for the foetus.

20 weeks later C-section was performed under subarachnoid block and the patient gave birth to a baby boy, birth weight 2590 grams, Apgar score 9.

CONCLUSION

Administration of anaesthesia for non-obstetric surgery during pregnancy has always been a challenge to the attending anaesthesiologists. The risk of surgery is not much different from the general population, but anaesthetic management is extremely challenging during this period. Safety of both the mother and the foetus is the prime objective while delivering anaesthesia services during these emergency surgical procedures.

In this case report we conclude that regional anaesthesia minimizes foetal drug exposure, airway management is simplified, blood loss may be decreased, and overall risks to the mother and foetus are lessened. Whatever procedure is carried out during this period, besides considering the pathophysiological aspects of pregnancy, universal precautions remain the same. It requires a good team effort from all quarters, especially the anaesthesiologist and the surgeon, to provide a safe atmosphere for both the mother and the foetus.

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